Patent Application No. 10/697,362
Amdt. Dated July 2, 2007
Reply to Final Office Action of May 7, 2007

Docket No. SAM2.PAU.33

REMARKS

Applicant hereby responds to the Final Office Action of May 7, 2007, in the above-referenced patent application. Applicant thanks the Examiner for carefully considering the application and for indicating that claims 5-12 and 17-24 contain allowable subject matter. Claims 2-12 and 14-24 are currently pending.

Claims 2, 5, and 16 are objected to for informalities. By way of this reply, claims 2, 5, and 16 have been responsively amended. Accordingly, withdrawal of the objections to claims 2, 5, and 16 is respectfully requested. Claims 2-7, 9, 10, 12, 15-19, 21, 22, and 24 have been additionally amended for minor informalities.

Claims 6 and 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. By way of this reply, claims 6 and 21-23 have been responsively amended. Accordingly, withdrawal of the rejection of claims 6 and 21-23 is respectfully requested.

Claims 5, 7, 17, and 19 have been rewritten in independent form including all of the limitations of the base claims and any intervening claims. Thus, claims 5-12 and 17-24 are now in condition of allowance.

No new matter is added by way of these amendments and none of the amendments is made in view of prior art.

Claims 2-4 and 14-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,844,627 ("May") in view of U.S. Patent No. 6,757,442 ("Avinash"). The rejection is respectfully traversed because for at least the following reasons, May and Avinash, whether considered separately or in combination, fail to disclose or suggest the claimed limitations.

The claimed invention is directed to a method and system for reducing noise in a digital image. Independent claims 3 and 15 each require, in part, (i) computing a plurality of 1-D local variances along multiple directions through the given pixel in the window; (ii) and detecting a local edge direction by selecting one of the directions with the smallest 1-D local variance. May and Avinash, by contrast, fail to disclose or suggest at least the limitations (i) and (ii).

As the Examiner agrees in the instant Office Action, May fails to disclose or fairly suggest the above-mentioned limitations (i) and (ii). However, the Examiner asserts that Avinash discloses such limitations, and that May and Avinash can be combined. Applicant respectfully disagrees.

Avinash is directed to an approach fundamentally different from the claimed invention. Referring to, *e.g.*, col. 10, lines 35-37, Avinash states:

> With the **structure** of the image thus **identified**, orientation **smoothing** of the structure, as indicated at step 68 of FIG. 4, is **carried out** through logic such as...

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As such, it is clear that Avinash teaches that the structures (including the edges) must be identified *first*, and then other steps can follow. This contradicts the claimed limitations where "detecting a local edge direction" *follows* computing a plurality of 1-D local variances.

Further, Applicant respectfully submits that contrary to the Examiner's assertions, the orientation smoothing step in Avinash (*see, e.g.*, col. 10, lines 4-67 and col. 11, lines 1-3; relied upon in the instant Office Action) does *not* include the claimed limitations of "detecting a local edge direction by selecting one of the directions with the smallest 1-D local variance." As discussed above, all the image structures in Avinash are already identified *without* seeking the smallest 1-D local variance. Indeed Avinash states, in col. 10, line 67 through col. 11, line 3, that:

> ... The direction of the minimum variance is selected from the four computed values and a corresponding directional index is assigned as indicated by reference numeral 184 in FIG. 12. ...

As further clearly seen in FIG. 12 of Avinash, numeral 184 indicates *all* four directions. Thus, it is clear that Avinash does not disclose "detecting a local edge direction by selecting one of the directions with the smallest 1-D local variance," and there is no need to do so as all the structures have already been identified as discussed above. Rather, Avinash discloses finding a dominant orientation for smoothing operations. Such a dominant orientation is *not* the same as, or equivalent to, the claimed edge direction, but rather is a direction optimized for applying the smoothing operation.

This is further evident from the fact that when calculating statistical variances in the four directions in Avinash, statistical variances for pixel *kernels* are calculated, *not* the "local variances along multiple directions through the given pixel in the window" as claimed. It is respectfully submitted that the Examiner has failed to supply why the statistical variances for pixel kernels in Avinash would be equivalent to the claimed "local variances."

Furthermore, it is respectfully submitted that Avinash teaches identifying a direction of minimum variance for each structural pixel *based on smoothed values for structure* (*see, e.g.*, col. 13, line 48), not "along multiple directions through the given pixel in the window" as claimed. Again the identified direction in Avinash is a direction for dominant smoothing operation, *not* the claimed "local edge direction." The statistical variances for pixel kernels in Avinash are not the same as or equivalent to the claimed "local variances".

Moreover, while May is directed to reducing spatial noise based on local variances, in Avinash the image structures including edges are identified *in priori* as discussed above, there is no motivation to combine Avinash with May to supply the 1-D variances that which May lacks. In addition, there is no reason given in the instant Office Action for any motivation, suggestion or teaching to modify Avinash to calculate 1-D variances first and then to identify the structures. Indeed, without the requisite smoothing operation for the image structures (*see, e.g.*, col. 13, line 48 of Avinash), the calculation in Avinash would likely fail because of divergence problems in the un-smoothed image

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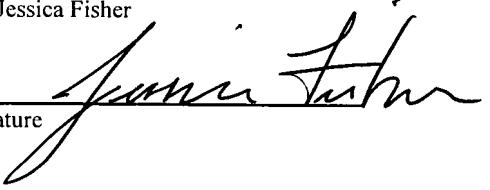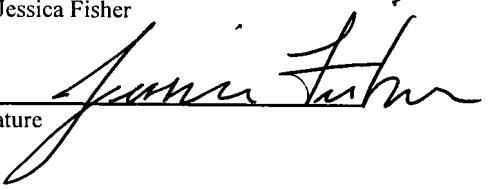
structure. If proposed modification would render the prior art invention being modified

unsatisfactory for its intended purpose, then there is no suggestion or motivation to make

the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir.

1984).

In view of the above, May and Avinash, whether considered separately or in

combination, fail to disclose or suggest the claimed invention as recited in independent

claims 3 and 14 of the present application. In addition, there is no motivation or

suggestion to combine May with Avinash or to make modifications to May and Avinash.

Thus, independent claims 3 and 15 of the present application are patentable over May and

Avinash for at least the reasons set forth above. Dependent claims 2, 4, 14, and 16 are

allowable for at least the same reasons. Accordingly, withdrawal of the rejection is

respectfully requested.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully requests that the rejections of the claims be withdrawn, and that the case be passed to issue. If the Examiner feels that a telephone interview would be helpful to the further prosecution of this case, Applicant respectfully requests that the undersigned attorney be contacted at the listed telephone number.

Please direct all correspondence to **Myers, Dawes Andras & Sherman, LLP**, 19900 MacArthur Blvd., 11th Floor, Irvine, California 92612.

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MS AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on July 2, 2007

By: Jessica Fisher

Signature

Respectfully submitted,
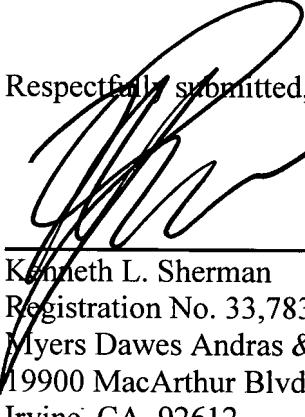
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